4

Introduction

A local transportation system should provide access to employment, shopping, recreation, and community facilities in a safe, efficient manner. When a transportation system operates well, it supports the community's quality of life, economy, and public and environmental health. Arlington's road network or capacity has barely changed in decades, yet a considerable amount of new traffic from Arlington and neighboring towns has placed strain on it, particularly on the main arterial routes, and in Arlington Center. Automobile traffic combined with bus routes, growing bicycle usage, and pedestrians create many issues that affect each of these transportation modes, and have effects of economic development, health and quality of life for residents.

In Arlington, the Board of Selectmen is responsible for all public ways under the Town's jurisdiction. Arlington has a Transportation Advisory Committee (TAC), which assists the Board of Selectmen in studying and making recommendations on transportation-related issues. The TAC includes representatives from the Police Department Traffic Unit, the Planning Department, the Town Engineer, and resident volunteers.

Existing Conditions

General Circulation, Network and Connectivity Characteristics

Arlington has a relatively complete network of streets, sidewalks, pathways, and trails. Most of the older neighborhoods in town were laid out on dense street

traffic & circulation

grids, with narrow streets, sidewalks and shady trees, creating a very walkable environment. Some of the newer neighborhoods in the hillier northern sections of Arlington have a more suburban street pattern with wider rights-of way, curving roadways, cul-de-sacs, and fewer sidewalk and streetscape amenities. This form of street pattern is generally less walkable. These neighborhoods are also further from Massachusetts Avenue, making them less accessible on foot to public transportation and services.

Massachusetts Avenue is a former streetcar corridor that, until 1955, had dedicated track lanes with service between Arlington Heights and Harvard Square. This supported a mainly non-automobile environment along Massachusetts Avenue, with most development and business activity in Arlington based on proximity to Massachusetts Avenue. Once the streetcar infrastructure was removed and replaced with bus transit, traffic increased as the automobile became more popular. The corridor still functions as the spine of Arlington's road and transit system.

Arlington's village centers (Arlington Heights, Arlington Center, and East Arlington) and most residential neighborhoods are interconnected, with relatively few dead-end streets and cul-de-sacs. This "healthy" street network with short blocks and dense development gives Arlington the look and feel of a walkable community. Pedestrians and cars have direct paths to their destinations. The physical characteristics, geometric conditions, adjacent land uses, and current operating conditions of Arlington's principal roadways

master plan goals for traffic & circulation

- Enhance mobility and increase safety by maximizing transit, bicycle, and pedestrian access and other alternative modes of transportation.
- ° Manage congestion safely and efficiently by improving traffic operations.
- Manage the supply of parking in commercial areas in order to support Arlington businesses.



and intersections are described below. Table 4.1 identifies the total road mileage by functional classification. Map 4.1 illustrates the basic components of Arlington's road system.¹

4.1. Classification of Roads in Arlington			
Class	Road Miles	Lane Miles	
Arterial	20.76	52.85	
Collector	10.05	20.09	
Local	89.99	177.18	
Total Miles	120.80*	250.12*	
Source: MassDOT Road Inventory Year End Report, 2012. * Does not include roads owned by State.			

KEY ARTERIALS

Five state and federal numbered routes and three key minor arterials serve Arlington. They include:

- 1. Route 2. The Massachusetts Department of Transportation (MassDOT) classifies Route 2 as a principal arterial, a major east-west route that runs between downtown Boston and the New York state line at Williamstown. It is a primary commuting corridor to Boston from the northwest suburbs and Central Massachusetts. Within Arlington town limits, it is a limited access highway with three to four travel lanes in each direction. Exits in Arlington include 56, 57, 58, 59, and 60.
- 2. Route 2A. Route 2A (Massachusetts Avenue/Mystic Street/Summer Street) runs east-west between Commonwealth Avenue in Boston and Interstate 91 in Greenfield, alongside or near Route 2. It generally provides more local access with lower traffic speeds than Route 2. In Arlington, Route 2A runs contiguous with Route 3 from the Alewife Brook Parkway/ Cambridge line, where it is classified as a principal arterial, and Summer Street, where it functions as a minor arterial.
- 3. Route 3. Route 3 is a State highway classified by MassDOT as a principal arterial. Route 3 runs north-south between the New Hampshire state line at Tyngsborough, MA and the Sagamore Bridge at the Cape Cod Canal. In Arlington, Route 3 starts on Mystic Street at the Winchester line in the north and joins Route 2A at Summer Street for the rest of the route to the Cambridge line. Route 3 consists of one wide lane in each direction (often used

- 4. Route 16. Route 16 is classified by MassDOT as a principal arterial south of Route 2A and as an urban major arterial north of Route 2A. It generally runs east-west between Bell Circle in Revere to the east and the intersection of Route 12/Route 193 in Webster, MA. Through Cambridge, however, Route 16 runs north-south along the Arlington town line, connecting Interstate 93 and Route 2. It generally consists of two travel lanes in each direction. While Route 16 does not run through Arlington, it has a significant impact on the traffic flow in the town.
- 5. Route 60. The Route 60 corridor is an urban major arterial that runs east-west between Route 1A in Revere to the east and Route 20 in Waltham to the west. In Arlington, Route 60 originates on Medford Street at the Medford city line to the north, continues onto Chestnut Street and Mystic Street, and along Pleasant Street to the Belmont line. It also connects with Interstate 93 and Route 2, and generally consists of one travel lane in each direction. Heavy vehicle traffic on Route 60 has increased significantly since hazardous cargo was prohibited on Boston's central artery.
- 6. Lake Street. Lake Street is classified by MassDOT as an urban minor arterial. It runs east-west between Massachusetts Avenue (Route 2A/ 3) and Route 2. Composed of one travel lane in each direction, Lake Street experiences significant congestion during commuter and school peak periods.
- 7. Mill Street. Mill Street is a short street that runs north-south between Massachusetts Avenue and Summer Street (Route 2A). Mill Street is classified by MassDOT as an urban minor arterial. Mill Street crosses the Minuteman Bikeway approximately 150 feet south of Summer Street and provides access to Arlington High School.
- 8. Park Avenue. Park Avenue, including Park Avenue Extension, is classified by MassDOT as an urban minor arterial, running north-south between Summer Street (Route 2A) to the north and the intersection of Marsh Street/Prospect Street in Bel-

as two) along Massachusetts Avenue and one lane in each direction along Mystic Street. It is a major commuting route into the Boston area from Winchester, Woburn, Burlington, and beyond.

¹ Definitions and descriptions of roadway classifications including arterials, collectors, and local roads are included in the Appendix.

Roadways by Class

(Source: MassDOT, 2014)

- Arterials: Arterials provide the highest level of mobility at the greatest vehicular speed for the longest uninterrupted distances and are not intended to provide access to specific locations. Arterials are further subdivided into Principal Arterials and Minor Arterials. Interstates are considered to be arterials but are given their own category in these maps.
- Collectors: Collectors provide some level of both mobility and access. They collect traffic from local roads and funnel it to arterials. In rural areas, collectors are further subdivided into Major Collectors and Minor Collectors.
- [°] Local roads: Local roads provide access to abutting land with little or no emphasis on mobility. The term "local road" should not be confused with local jurisdiction. Most, though not all, functionally classified local roads are under city or town jurisdiction.

mont to the south. Park Avenue generally consists of one travel lane in each direction, and it crosses over the Minuteman Bikeway 250 feet south of its intersection with Lowell Street/Westminster Avenue/Bow Street.

COLLECTOR ROADS

Collector roads provide more access to abutting land than arterials, and typically serve as a connection between arterials and networks of local roadways. Collector roadways in Arlington include, but are not limited to Gray Street, Hutchinson Road, Jason Street, and Washington Street.

LOCAL ROADS

Most roads in Arlington are classified as local roads and provide access to abutting land, with less emphasis on mobility. Nearly 90 miles (75 percent) of the roads in Arlington are functionally classified as local roads. Roads owned by MassDOT or DCR are not included in the total mileage of accepted or unaccepted town roads.

Accepted Town Roads. In total, Arlington has about 102 miles of town-accepted roads, which means the Town has accepted a layout of the street and owns the road in fee. By accepting the street, the Town takes responsibility for maintaining it.

Unaccepted Roads. Arlington has an additional 22.77 miles of unaccepted streets, also known as **private ways**. An unaccepted street is owned by those who use the way to access their properties. Private ways can be private by choice of the owners, but sometimes they remain unaccepted because they do not meet lo-

cal standards for roadway construction. As a matter of policy, Arlington plows private roads during the winter, but the owners remain responsible for road maintenance. Many of them are in deteriorated condition.

CONGESTION POINTS

The primary east-west routes through and next to Arlington are Route 2, Massachusetts Avenue, Broadway, Mystic Valley Parkway, Summer Street, and Gray Street. The primary north-south routes include Route 16, Lake Street, Route 60, Mystic Street, Jason Street, Mill Street, Highland Avenue, Park Avenue, and Appleton Street. Route 2A/Route 3 and Route 60, plus the Minuteman Bikeway, intersect in Arlington Center, creating a congested intersection with high volumes of vehicular, bicycle, and pedestrian traffic. The intersection of Massachusetts Avenue/Route 16, just over the Cambridge line, is a major intersection that often creates significant congestion for vehicles entering or exiting Arlington via Massachusetts Avenue.

SIGNALIZED INTERSECTIONS

Arlington has a total of thirty-four traffic signals (Map 4.2). When properly designed and supplemented with other necessary traffic control devices, e.g., signs and pavement markings, traffic signals improve safety and facilitate traffic flow by assigning right-of-way at intersections. Most traffic signals in Arlington fall within the Town's jurisdiction, but MassDOT and the Department of Conservation and Recreation (DCR) have jurisdiction over some intersections. Typically, the Town of Arlington has jurisdiction if it controls one or more of the roadways at an intersection, e.g., a state highway or another major arterial. A signal may be under DCR jurisdiction if located within or near DCR land. One

Table 4.2. Inventory of Signalized Intersections	by Jurisdiction		
Intersection	Jurisdiction	Intersection	Jurisdiction
Lake Street/Route 2 WB Ramps	MassDOT	Pleasant/Irving	Town
Park Ave./Frontage Road D (North Side)	MassDOT	Summer/Mill Street/Cutter Hill Rd.	Town
Pleasant/Frontage Road D (North Side)	MassDOT	Broadway/Bates/Warren/River	Town
Route 2A (Summer)/Overlook/Ryder	Town	Broadway/Franklin	Town
Route 2A (Summer)/Park Ave. Extension	Town	Park Ave./Florence Ave.	Town
Route 2A (Summer)/Forest	Town	Mystic/Columbia/Kimball	Town
Mass. Ave./Brattle Street	Town	Broadway/Oxford Street/N. Union	Town
Mystic/Summer/Mystic Valley Pkwy	Town	Mass. Ave./Shoulder Ct/Lockeland Ave.	Town
Mass. Ave./Lake Street/Winter	Town	Mass. Ave./High School Drive	Town
Mass. Ave./Pleasant/Mystic	Town	Mystic/Chestnut	Town
Mass. Ave./Broadway	Town	Medford Street/Warren	Town
Mass. Ave./Swan Place (Proposed)	Town	Appleton St./Appleton Place/Mass. Ave.	Town
Route 2A (Summer)/Brattle/Hemlock	Town	Lake/Brooks Ave.	Town
Mass. Ave./Park Ave.	Town	Mass. Ave./Jason/Mill	Town
Mass. Ave./Linwood/Foster	Town	Mass. Ave./Franklin	Town
Gray Street/Highland Ave.	Town	Lake Street/Route 2 E Exit 60	MassDOT
Broadway/Cleveland	Town	Mystic Valley Pkwy/River/Harvard Ave.	DCR
Mass. Ave./Thorndike/Teel	Town	Mass Ave./Route 16*	MassDOT
Source: Boston Regional Municipal Planning Or	ganization (CTPS).		

additional signal will be installed as part of the Massachusetts Avenue Reconstruction Project, and one additional signal will be installed as part of the Arlington Safe Travel Project. Table 4.2 contains a list of intersections and their jurisdictions.

SCENIC BYWAYS

The Battle Road Scenic Byway is a federally designated Scenic Byway that runs from Alewife Brook Parkway (Route 16) in East Arlington, along Massachusetts Avenue through Arlington, Lexington, Lincoln, and Concord. The Byway follows the approximate route of British regulars in April 1775 that preceded the Battle of Lexington and Concord and sparked the beginning of the American Revolution.

Traffic Volumes and Trends

Traffic Data. MassDOT maintains permanent count stations on some Arlington roadways. The MassDOT Count Book provides volume count data up to the year 2009, though data availability varies by count location.² The traffic counts indicate that volumes on certain primary roadways in and around Arlington have decreased

in the last few years. Outside the permanent count stations, MassDOT has also collected traffic counts on a variety of roadways to monitor traffic volumes where reconstruction or intersection improvements may be planned in the future.

During peak commuter periods, many of Arlington's roads and intersections experience significant congestion. Morning peak-period congestion occurs on Massachusetts Avenue approaching Route 16/Alewife Brook Parkway due to heavy delays at the intersection. This congestion reverberates back into East Arlington. According to town officials, traffic often backs up to and on Lake Street, which is also affected by Hardy School traffic during the morning peak hour and the bikeway crossing on Lake Street. The intersection of Massachusetts Avenue/Mystic Street/Pleasant Street, at the heart of Arlington Center, also experiences peak-period congestion, which continues along Mystic Street to Chestnut Street and along Pleasant Street to Route 2. Other intersections that experience peak-period congestion include Park Avenue at Massachusetts Avenue and at Downing Square/Lowell Street in Arlington Heights, and Broadway at River Street and Warren Street.

According to the TAC, congestion often occurs on Mill Street and Lake Street near their intersections with the Minuteman Bikeway. The intersection of Mill Street and

² See Appendix for MassDOT traffic volumes recorded from 2006 to 2009, the most recent years available for Arlington and the surrounding towns. Vision 2020 also contains local traffic volume counts; Traffic counts were not collected in Arlington from 2003 to 2005.

the Minuteman Bikeway is located between two busy signalized intersections, one at Summer Street (Route 2A) and one at Massachusetts Avenue. Pedestrian and bicycle traffic crossing Mill Street can reduce the efficiency of the two signals and cause congestion on Mill Street. At the Minuteman Bikeway crossing of Mill Street, a flashing beacon was recently installed to alert drivers of oncoming bicyclists and pedestrians, and facilitate traffic flow when there are no Bikeway users crossing. The intersection of Lake Street and the Minuteman Bikeway is located approximately 200 feet west of the signalized intersection of Lake Street/Brooks Avenue. Similar to the Minuteman Bikeway's crossing at Mill Street, users of the Minuteman Bikeway crossing Lake Street can create inefficiency at the signal at Lake Street/Brooks Avenue, resulting in additional congestion on Lake Street.

TAC members anticipate that new development in Cambridge and Belmont oriented towards Alewife Station may cause additional congestion along Route 2, Route 16, Lake Street, and Massachusetts Avenue in East Arlington.

Bicycle and Pedestrian Facilities

Sidewalks. Arlington has an extensive sidewalk network that provides safe and convenient travel for pedestrians. All of the town's major corridors have complete sidewalks as do all but a few neighborhoods. According to a 2003 study, areas with limited sidewalks are primarily in the northwest part of town (Turkey Hill neighborhood), areas around Ridge Street and the Stratton School, and in the southwest areas of Little Scotland and Poets Corner. In addition to these neigh-

borhoods, private ways generally lack sidewalks, according to town officials. In the older neighborhoods, a planting strip with mature trees usually separates the sidewalks from the travel lane, thus giving shade and safety to pedestrians.

Along Massachusetts Avenue and Broadway, there are several wide side-walk segments that support outdoor dining and provide pedestrian amenities. However, both corridors also have extensive curb cuts in some locations. This significantly degrades the pedestrian environment and presents a safety concern.

The Arlington Transportation Assessment Study (The Louis Berger Group, 2002) reported the condition of sidewalks in most areas of town as generally good or fair. At the time, only a few streets were found to have poor sidewalks. However, sidewalk conditions in some areas appear to have deteriorated since the study was completed. The Arlington Department of Public Works (DPW) prioritizes and constructs or repairs sidewalks and accessible ramps each year. An inventory of the Town's sidewalks and curbs is underway and expected to be complete in early 2015.

PATHWAYS

The Minuteman Bikeway is an 11-mile shared-use path that provides a dedicated facility for pedestrians and bicyclists to travel through Bedford, Lexington, Arlington, and into Cambridge. The Arlington section of the bikeway is three miles in length, and connects many important town parks, recreational areas, and cultural/historic sites, including: the Arlington Reservoir, Old Schwamb Mill, the Summer Street Sports Complex/Ice Rink, Wellington Park, Buzzell Field, Dallin Museum/Whittemore Park, Spy Pond, and the Thorndike/Magnolia Fields. The path runs roughly parallel to Massachusetts Avenue and provides connections to the town's major business districts in Arlington Heights, Arlington Center, and East Arlington.

The Minuteman Bikeway provides a convenient intermodal connection to the MBTA Red Line at Alewife Station, and serves as a primary commuter cycling route. It connects with numerous paths and trails, including the Alewife Linear Park/Somerville Community Path, the Fitchburg Cut-off Path, the Alewife Green-



Sidewalks in the East Arlington commercial center on Massachusetts Avenue.

Table 4.3. Arlington Center Parking Inventory				
Type of Space	On Street	Public Lots	Total	
15 Minute	5	0	5	
One Hour	103	0	103	
Two Hour	63	0	63	
Three Hour	0	208	208	
Permit	0	123	123	
Unrestricted	38	0	38	
Handicap	4	15	19	
Taxi	4	0	4	
Zipcar*	0	2	2	
Total	217	348	565	
Source: Arlington Transportation Advisory Committee Study.				

way, the Narrow-Gauge Rail-Trail, and the Reformatory Branch Rail-Trail.

The Minuteman Bikeway does not have lighting, which may deter users in the winter months when the sun sets before the end of the workday. Physically, the path is in need of some repair. The Bikeway is plowed by the Town.

BIKE FACILITIES

May 20, 2013

According to bicycle network maps from the Arlington Bicycle Advisory Committee,³ Arlington has bicycle lanes or wide shoulders on portions of Massachusetts Avenue, Mystic Valley Parkway, and Park Avenue. The Town evaluates all major roadways for bike lane appropriateness whenever they are resurfaced. Shared lane markings, or "sharrows", are provided on some roadways, including portions of Massachusetts Avenue.

According to the 2012 Vision 2020 survey, more respondents supported additional bike lanes and bike routes (46.5 percent) than opposed them (29.1 percent). Except for the Minuteman Bikeway, the Town's network of dedicated bicycle facilities (bicycle lanes and paths) is limited and incongruous. An extension of the network as well as safe, continuous connections between neighborhoods and key bicycle thoroughfares may help to increase the number of Arlington residents that commute by bicycle.

Parking Facilities

ARLINGTON CENTER

In May 2013, Arlington's Transportation Advisory Committee (TAC) conducted a parking study in Arlington Center to determine where and when parking demand is highest. The study identified a total of 565 on- and off-street public parking spaces (Table 4.3). This includes on-street spaces on Massachusetts Avenue between Academy Street/Central Street and Franklin Street; Broadway between Franklin Street and Alton Street; Alton Street south of Belton Street; Medford Street south of Compton Street (St. Agnes Church); Pleasant Street between Massachusetts Avenue and Maple Street/Lombard Road; and Swan Street. The offstreet public parking inventory includes Broadway Plaza, the Library Parking Lot, Russell Common Municipal Lot, and the Railroad Avenue Lot. In addition to the available public parking spaces, there is also a significant amount of private parking in and around Arlington Center. These parking spaces are used by employees and visitors to the approximately 365,000 square feet of businesses in Arlington Center.

The study concluded that weekday parking demand peaks at 1:00 PM, when most on-street spaces are occupied but spaces are generally available in the public three-hour parking lots; and at 6:00 PM, when onstreet parking and the public lots approach capacity. On Saturdays, demand for on-street parking exceeds capacity and the public lots approach capacity at the midday peak of 11:00 AM At the evening peak period, 7:00 PM, the on-street spaces are near capacity while the public lots have some parking availability. The study identifies strategies to maximize the efficiency of available public parking, such as improving wayfinding signage and internal signage and converting all on-street spaces to two-hour spaces.

EAST ARLINGTON

According to a recent parking inventory,⁴ the East Arlington commercial center has approximately 945 parking spaces, including approximately 250 privately owned off-street parking spaces at the Crosby School, Cambridge Savings Bank (180 Massachusetts Avenue), Summit House, Trinity Baptist Church, and others. These privately-owned spaces are not available for use

³ N.B. The Arlington Bicycle Advisory Committee (ABAC) was appointed by the Board of Selectmen in 1996 to advise the Town on local bicycling conditions. The committee promotes all forms of safe bicycling on town roadways and the Minuteman Bikeway, from recreational riding to using the bicycle for transportation and errands.

Walker Parking Arlington Commercial Development Plan Strategies Assessment Phase II - East Arlington Supplement, October 29, 2009, Larry Koff & Associates, Todreas Hanley Associates, Walker Parking Consultants.

by the general public. In addition to private spaces, there are roughly 600 on-street parking spaces on side streets located within walking distance of the commercial center. Ninety-six on-street parking spaces along Massachusetts Avenue are designated for customers, but many are occupied by employees, leaving fewer convenient spaces for customers. These 96 spaces are the only spaces in the district that are intended for customer use. The 945 total spaces are used by approximately 103,000 square feet of residential and commercial uses in East Arlington. In 2010, the TAC worked with business owners and employees in East Arlington to prepare a "Where to Park" guide to help preserve the best on-street parking spaces for business customers.

ARLINGTON HEIGHTS

Parking supply for Arlington Heights was estimated using aerial imagery. Approximately 200 parking spaces were identified along Massachusetts Avenue between Drake Road and Appleton Street, and an additional 33 parking spaces on Park Avenue between Paul Revere Road and the Arlington Coal and Lumber driveway. On-street spaces are typically 2-hour parking, with some spaces designated as handicap parking or taxi stands. There are approximately 525 off-street parking spaces, primarily located behind or adjacent to private properties along Massachusetts Avenue and Park Avenue. The combination of the on-street and off-street parking spaces equal a total of approximately 758 parking spaces.

Arlington Heights includes approximately 422,000 square feet of development. The individual parking demand of the individual homes, businesses, and other land uses is 969 spaces; however, Arlington Heights is a mixed-use area with a large variety of land uses. The mixed-use nature of the neighborhood allows for visitors to the area to make multiple trips and for nearby residents to walk to nearby businesses without driving. The variety of businesses in Arlington Heights means that the peak demand for each business is not likely to occur at the same time; for example, a restaurant would not have the same peak demand time as a medical office, and parking spaces can be "shared" between these two land uses.

PARKING RULES AND REGULATIONS

Arlington typically restricts parking on major roadways to two hours, but in some areas it is restricted to one hour or less. On residential streets, daytime parking is typically unrestricted. Overnight parking is not permitted except by special permit.

Arlington's zoning imposes flexible off-street parking and loading requirements for residential and business districts, with alternatives to providing all spaces on the site. The off-street parking regulations in Section 8.01 are adequate for typical commercial uses in the business districts, e.g., one space per 300 gross sq. ft. of retail floor area, one space per four seats in a restaurant, and one space per 500 gross sq. ft. of office floor area. The regulations provide for shared parking between adjacent uses and modified off-street parking requirements if enough satellite parking can be secured within 600 feet or if adequate public parking is available within 1,000 feet. In addition, the regulations include basic design standards such as restricting parking and driveways in front of buildings, landscaping and paving standards, and bicycle parking in developments subject to Environmental Design Review.

CAR SHARING

Zipcar is a car rental company that specializes in ultrashort-term rentals. Zipcar charges an annual fee, plus a demand-driven hourly charge. Zipcar has eight locations in Arlington with a capacity for fourteen Zipcars. The Zipcar stations are mostly located along Massachusetts Avenue and more concentrated in East Arlington, close to the Cambridge line. While Zipcar will not replace a personal vehicle in most households, it does allow residents without a personal vehicle to make periodic regional trips.

Traffic Safety

Vehicle, Pedestrian, and Bicycle Accidents

According to MassDOT, a total of 1,664 crashes occurred in Arlington between 2008 and 2010, or an average of 13.8 crashes per mile. For comparison, the bordering municipalities of Cambridge, Lexington, and Somerville average 17.1, 4.2, and 9.7 crashes per mile, respectively. These figures are per roadway mile, not vehicle miles traveled, so it is reasonable to expect a higher ratio in communities that experience heavier traffic volumes than Arlington, such as Cambridge, or lower traffic volumes than Arlington, such as Lexington. Of the 1,664 crashes reported by MassDOT, 37 (2.2 percent) involved pedestrians, and 57 crashes (3.7 percent) involved cyclists. A significant portion of crashes involving pedestrians occurred around Arlington Center. Most crashes involving bicycles occurred

along Massachusetts Avenue. Of the total crashes, 294 (17.7 percent) resulted in personal injury.

MassDOT lists the intersection of Massachusetts Avenue/Mystic Street/Pleasant Street in Arlington Center in its most recent statewide 200 Top Crash Locations Report (September 2012). The intersection was ranked 95, with sixty-eight crashes from 2008-2010. The Arlington Safe Travel Project (MassDOT Project #606885) aims to reduce the number of crashes of all types within Arlington Center.

The Arlington Police Department identifies high crash location "hot spots" each year to help show where the most crashes occur within the town. These locations are mapped in Map 4.3, and in 2013 included Arlington Center; Route 60/Mystic Valley Parkway; Pleasant Street/Gray Street; Mystic Street/Summer Street; Massachusetts Avenue at Forest Street, Park Street, Paul Revere Road, and the entire length of Massachusetts Avenue in East Arlington. Moreover, after a high number of fatal pedestrian crashes in the 1990s, greater emphasis was placed on pedestrian safety, including more visible marked crosswalks and more enforcement.

Safe Routes to School

Arlington was one of the first two towns in the country to start a Safe Routes to School program. The state chose Dallin Elementary School as a pilot site. In October 2011, the Town of Arlington and MassDOT completed access and safety improvements for pedestrian and bicycle access to Dallin Elementary School using Safe Routes to School funds. The project introduced infrastructure enhancements to slow traffic and upgrade crosswalks and sidewalks. It also added new crosswalks across roadways where no crossings previously existed.

In 2014, all of the elementary schools and the middle school participate in the program. Each school has assessed walking routes and made some safety improvements to promote walking to school. A Safe Routes to Schools Task Force was formed, including representatives from each participating school, the Arlington Police Department, Arlington Public Schools Health and Wellness Department, and the Arlington Transportation Advisory Committee. The Safe Routes to School task force organizes Walk/Bike to School Days, pedestrian safety training, and other walking and biking events at all of the participating schools. Together, the neighborhood locations of Arlington's elementary schools and the Safe Routes to School program have removed the

High Crash Hot Spots

The intersection of Massachusetts Avenue/Mystic Street/Pleasant Street in Arlington Center ranks 95th in the state's most recent statewide 200 Top Crash Locations Report (September 2012). Locally identified "hot spots" include Arlington Center, Route 60/Mystic Valley Parkway, Pleasant Street/Gray Street, Mystic Street/Summer Street,, Massachusetts Avenue at Forest Street, Park Street, Paul Revere Road, and the entire length of Massachusetts Avenue in East Arlington.

need for school buses at all elementary schools except for Bishop School. Students who cannot walk or ride a bicycle to school may be able to take MBTA buses. Many children are dropped off by car, however, causing congestion around schools in the morning and mid-afternoon.

Winter Snow/Ice Removal

The Arlington DPW plows all roadways in the town as well as the Minuteman Bikeway. Residents and business owners are responsible for clearing the sidewalks adjacent to their properties, and the MBTA is responsible for clearing snow and ice from bus stops.

General Travel Patterns and Modal Splits

Household Travel Patterns

Modal split describes the percentage of trips that are made by each of the different transportation modes, e.g., driving alone, driving with others (shared rides, carpooling), public transit, walking, or bicycling. Arlington has an average of 2.24 people per household and 1.46 vehicles per household, according to the 2006-2010 American Community Survey This translates to one vehicle per 1.5 people in every household, which is lower than the regional average and consistent

with the high level of commuting by public transit and bicycle.⁵ A 2014 on-line survey by the Route 128 Business Council and answered by 1300 households found that 93 percent of Arlington residents own a car (4 percent have no car, 41 percent have one car, 48 percent have two cars, and 7 percent have more than two cars).

Thirty-nine percent of Arlington's commuters work in Boston and Cambridge, and 80 percent of these commuters live within one-quarter mile of a bus stop; considered an acceptable walk to a transit stop. Forty percent of Arlington residents who commute to Cambridge or Boston use bus transit, though a greater number, 49 percent, drive alone.6

Commuting to Work

The top two destinations for Arlington commuters are Boston and Cambridge. In third place is the internal commute within Arlington. The number of residents working in town grew between 2000 and 2010. Additionally, fewer Arlington residents commuted to Boston in 2010 than in 2000, and more residents commuted to Cambridge, Lexington, and Medford.

Of those who work in Arlington, more live in Arlington than any other community. Arlington residents make up about 37 percent of all employees of local establishments. Between 2000 and Source: MBTA Ridership and Service Statistics, 14th Edition (2014), data as of Fall 2012

Table 4.4: Top Commuting Destinations for Arlington Residents					
Con	nmute Destination	Avg. Commute	Census 2000	ACS 2006-10	% Change
1.	Boston	27 minutes	5,095	4,942	-3.0%
2.	Cambridge	21 minutes	4,048	4,262	5.3%
3.	Arlington	N/A	3,450	3,640	5.5%
4.	Lexington	12 minutes	849	932	9.8%
5.	Burlington	19 minutes	753	821	9.0%
6.	Waltham	18 minutes	1,1 <i>77</i>	769	-34.7%
7.	Medford	14 minutes	428	643	50.2%
8.	Somerville	21 minutes	602	603	0.2%
9.	Woburn	16 minutes	370	489	32.2%
10.	Newton	29 minutes	544	468	-14.0%

Source: U.S. Census Bureau, Census Transportation Planning Package (CTPP).

Table 4.5: Means of Transportation to Work				
Means of Transportation	Census 2000	%	ACS 2006-	%
			2010	
Drove alone	16,035	67.6%	15,437	66.5%
2-person carpool	1,335	5.6%	1,158	5.0%
3+ person carpool	290	1.2%	251	1.1%
Public Transportation	4,205	17.7%	3,887	16.7%
Bicycle	225	0.9%	489	2.1%
Walk	430	1.8%	552	2.4%
Taxi, motorcycle, other	79	0.3%	1 <i>57</i>	0.7%
Work at Home	1,115	4.7%	1,296	5.6%
Total	23,715	100.0%	23,277	100.0%

Source: U.S. Census Bureau, CTPP.

The percentages represented in Table 4.5 reflect the longest single mode used when commuting to work, and do not reflect the shorter legs of a multi-modal commute. For example, a person who rides a bike to Alewife Station, then commutes to Downtown Crossing, will be counted as a transit trip, and not a bicycle trip.

Table 4.6. Typical Boardings on Bus Routes through Arlington					
MBTA Bus	Municipalities Served	Typical Daily	Typical Daily	Typical	
Route		Inbound Boardings	Outbound	Daily Total	
		(Weekday)	Boardings	Boardings	
			(Weekday)	(Weekday)	
#62	Lexington, Arlington	922	722	1,644	
#67	Arlington	312	276	588	
#76	Lexington, Lincoln	560	431	991	
#77	Arlington	3,635	4,004	7,640	
#79	Arlington	684	577	1,261	
#350	Arlington	665	989	1,653	
C					

⁵ CTPP Profile of Arlington (Socio-Demographic Data and Transportation Mode Shares)

2010, the number of Arlington residents working in Arlington increased 5.5 percent, but the number of employees commuting from Boston, Cambridge, Medford, and Lexington also rose significantly, which suggests that more residents of other municipalities are commuting to work at Arlington businesses.

⁶ CTPS Report on Alewife Feeders from Arlington (2009), http:// www.ctps.org/Drupal/data/pdf/studies/highway/alewife/Improvements_MBTA_Feeder_Bus_Routes.pdf

Commuting Time. On average, Arlington workers spend 22 minutes commuting to work. Workers with commutes to places in Lexington, Waltham, and Medford have shorter-than-average commutes due to proximity, the "reverse commute" factor, and several choices for less congested routes. Workers commuting to Boston or Newton experience higher-than-average commutes due to congestion or, in the case of Newton, the lack of a direct arterial route.

Means of Travel. The percentage of Arlington residents who drove to work alone decreased slightly between 2000 and 2010 (Table 4.5) but still represent about two-thirds of Arlington's employed labor force. The percentage of residents carpooling or using public transportation also decreased. More Arlington residents walked or cycled to work in 2010 than in 2000. In fact, the mode share of bicycle commuters more than doubled, from 0.9 percent in 2000 to 2.1 percent in 2010. Lastly, Arlington has witnessed noticeable growth in the number of residents working at home.

Public Transportation. According to the American Community Survey (ACS) 3,887 Arlington residents (16.7 percent of the population) commuted to work using public transit each day. The primary means of public transit in Arlington is MBTA bus service. The Alewife MBTA Station is not in Arlington, but is a short drive, walk, or bike ride for many residents.

Bus Transit. Eleven MBTA bus routes run through Arlington. Most connect to the Red line via Alewife Station (#62, #67, #76, #79, #84, #350 buses) or Harvard Station (#77 and #78 buses). The #80 and #87 buses connect to the Green Line at Lechmere Station; the #87 bus also connects to Davis Square Station. From Lechmere, the Green Line provides connections to Downtown Boston, Longwood area, Brookline, Brighton, and Newton, and Jamaica Plain. The #77 bus provides the most frequent service to the MBTA Red Line, leaving Arlington Heights with peak hour weekday service approximately every eight minutes and weekend service approximately every ten minutes. The #350 bus runs through Arlington between Alewife Station and Burlington, a major employment and retail center.

Typical daily boarding figures for the #62, #67, #76, #77, #79, and #350 bus routes is shown in Table 4.6. It should be noted that Table 4.6 does not encompass all of the bus routes available to Arlington

residents, just the ones listed by the Battle Road Scenic Byway Corridor Management Plan.

Town officials noted that bus routes through Arlington are often delayed and have irregular headways due to congestion on Massachusetts Avenue and around Alewife Station, including the intersection of Massachusetts Avenue/Route 16 in Cambridge, locations not under Arlington's jurisdiction.

Rapid Transit. There are no rapid transit stations in Arlington, but the Alewife Station in Cambridge is only 1000 feet southeast of the Arlington town line and two miles southeast of Arlington Center. Alewife Station is a terminal station on the MBTA Red Line, which connects with Somerville, Cambridge, Quincy, Braintree, downtown Boston, south Boston, and Dorchester.

The Green Line Extension (GLX). The GLX is scheduled to be completed in 2019, and will extend the Green Line to College Avenue / Tufts University in Medford. This new terminus will be within 1 mile of East Arlington. Possible future extensions to Route 16 is under consideration but unfunded. Arlington TAC members stated that the Town supports an extension to Route 16 at Boston Avenue in Medford, which would be within a quarter mile of Arlington's northeast border.

Commuter Rail. Arlington is located within 1-2 miles of four MBTA commuter rail stations in Belmont, Winchester, Cambridge, and West Medford. Trains from these stations connect to North Station in Boston, and offer two-direction service throughout the day.

Intercity Bus Service. Go Buses offer bus service up to eight times a day to New York City from Alewife Station, with one stop in Newton.

Para-transit Services. Several transportation options exist for senior citizens and people with disabilities. The Arlington Council on Aging (COA) offers Dial-a-Ride Taxi (DART) service for Arlington seniors age 62 or older, income-eligible seniors 60-62 years, and residents with disabilities. The service costs \$15 per year and \$3 per one-way trip. According to Arlington's 2011 Vision 2020 Annual Survey, 2.7 percent of those surveyed used the DART service and 38.1 percent of seniors know about it but have not used it. The COA also operates a Senior Center Van, a Medical Appointment Van, and medical escort services. The Ride is a para-transit service provided by the MBTA that offers door-to-door shared-ride transportation for eligible people that cannot access fixed-route transit

because of physical, cognitive, or mental disability. It is available 365 days per year from 5:00 AM to 1:00 AM in 60 cities and towns, including Arlington. Fares are \$3 one-way as of January 6, 2014.

Issues and Opportunities

Drawing on feedback at the World Café event in October 2012 and at various community meetings, Arlington residents have identified congestion and pedestrian safety as significant transportation issues. Many participants are concerned that traffic congestion is having a negative impact on business development, pedestrian and bicycle safety, and transit efficiency. Through follow up meetings with Arlington town officials, including members of the TAC, Department of Planning and Community Development, Engineering Division, Police Department, and Department of Public Works, several transportation challenges were identified, and these groups continue to work together to improve traffic conditions.

Traffic Congestion

Traffic congestion can be a significant negative factor to both personal productivity and the economic health of a community. Traffic congestion occurs when the demand placed on a transportation facility exceeds its capacity. This can happen for many reasons, both recurring and nonrecurring. Nonrecurring congestion usually responds to random events such as crashes and inclement weather. Recurring congestion is often the result of a fundamental lack of roadway or intersection capacity.

LOCAL AND REGIONAL CONGESTION CONTRIBUTORS

Several local and regional factors have been identified as contributing to traffic congestion in Arlington.

Local commuting patterns contribute to overall congestion. Arlington generally has lower commute times, higher use of public transit and non-vehicle means of travel, and less daily mileage per household than its neighbors to the west. However, commuters to and from Arlington are still likely to be driving alone to work.

Traffic congestion near most schools during **school peak hours** results from pick-up or drop off activity.

North-south arteries in Arlington often experience traffic congestion as a result of congestion on primary

east-west corridors including Massachusetts Avenue, Summer Street, Broadway, and Route 2.

Congestion along Route 16 causes bottlenecks at key intersections and causes back-ups on Massachusetts Avenue and Broadway.

Existing and anticipated development in Cambridge, Somerville, and Belmont will likely contribute to increased traffic congestion in Arlington.

Massachusetts Avenue corridor and intersections:

- Western Segment Slow traffic due to volume on this two-lane section of Massachusetts Avenue west of Arlington Center is the main cause of congestion here. Congestion on Park Avenue at the intersection of Massachusetts Avenue is due to the lack of a protected left-turn phase onto Massachusetts Avenue. This has been identified as a safety issue for both drivers and pedestrians.
- 2. Central Segment Congestion in Arlington Center is largely attributable to the Pleasant Street/ Mystic Street intersection. This is being addressed by the Arlington Center Safe Travel project which will also provide a solution to the unsafe and inconvenient crossing of the Minuteman Bikeway. The goal is to improve traffic operations and pedestrian safety by shortening crosswalk lengths, coordinating signals, and increasing turning lane capacity.
- is another congested intersection near Arlington Center. Jason Street is not designed to handle the amount of commuter traffic it is now carrying between Massachusetts Avenue and Route 2. The redesign of this intersection is underway and will include lane reconfiguration and signal improvements to address the high volume and crash rate at the intersection.
- 4. Massachusetts Avenue/Water Street poses a pedestrian safety issue, due to the high pedestrian use owing to the proximity of the library, Town Hall, businesses, and restaurants. Its proximity to the busy intersection with Route 60 also poses challenges.
- Eastern Segment Congestion on Massachusetts
 Avenue in East Arlington during the morning peak
 hour is primarily due to inadequate capacity at the

intersection with Route 16 in Cambridge. The ongoing Massachusetts Avenue Rebuild Project (MassDOT Project #604687) will reconstruct the corridor between the Cambridge city line and Pond Lane, a distance of approximately one mile. This project will improve pavement conditions and mobility for vehicles, pedestrians, and bicyclists by improving traffic signal timing. It will also enhance safety and streetscape conditions in East Arlington, and improve capacity the Lake Street intersection.

Pleasant Street Corridor. Congestion on the Pleasant Street corridor between Massachusetts Avenue and Route 2 may be attributed to insufficient capacity on Pleasant Street and a heavy demand for travel between the two east-west roadways. Capacity limitations are tied to the directional commuting; southbound (AM) and northbound (PM). The Arlington Center Safe Travel Project may reduce back-ups at the intersection by improving traffic signal timing.

Mill Street Corridor. Mill Street approaching Summer Street is congested particularly during the AM and PM peak hour and because of the nearby Arlington High School, and Minuteman Bikeway crossing just south of Summer Street.

Lake Street Corridor. Lake Street traffic congestion between Massachusetts Avenue and Route 2 is attributable to several factors, including congestion on Massachusetts Avenue, traffic at the nearby Hardy Elementary School, the Minuteman Bikeway crossing just south of Massachusetts Avenue, and the on/off ramp at Route 2. It is anticipated that congestion will be reduced with the planned improvements to the intersection at Massachusetts Avenue. However, new development in and around Alewife may increase the number of cars using Lake Street, and those trying to avoid congestion on Route 16.

Pedestrian Facilities, Access and Safety SIDEWALK NETWORK AND CONDITIONS

Arlington is generally well connected by sidewalks on residential streets and in most business districts. Older neighborhoods in Arlington usually have 4-foot sidewalks, which although aging are in relatively good condition. Some neighborhoods, however, are underserved by sidewalks, such as the residential area between Gray Street, Buena Vista Road, Hawthorne Ave., and Highland Avenue. Additionally, many street in the northeast neighborhoods in town have limited or no sidewalks.

The Public Works Department prioritizes construction and repairs for new sidewalks and handicapped ramps each year, including pavement markings and crosswalks. Arlington is also an active participant in the Safe Routes to School Program (SRTS). However, according to SRTS officials, additional funding from the State is unlikely in the near term because the Dallin school sidewalk improvements were recently completed, and towns typically receive reconstruction funding for one project only.

PEDESTRIANS AT INTERSECTIONS

Broadway/Warren Street and Broadway/Bates Road/ River Street. These intersections have particularly poor sidewalks, signal timing, and irregular intersection angles. There is only one crosswalk at the intersection of Broadway/Warren Street, and the wide angle of the intersection permits high speed turning from Broadway eastbound onto Warren Street. There are no sidewalks along any of the edges of the triangular park located between Broadway, Warren Street, and River Street, and there are no marked crosswalks leading to the park, causing pedestrians to divert their routes around the park, rather than being able to walk through it.

Mystic Valley Parkway/Route 60 (Medford Street). Congestion and lack of safe pedestrian crossings at this intersection is a priority issue for the town. Two major arterial roads merge together with a pedestrian trail at a dual rotary intersection. The rotary itself is under DCR jurisdiction. Two crosswalks were recently added, but additional safety improvements are still needed.

Bicycle Facilities, Access and Safety

Minuteman Bikeway. The bikeway is divided by Massachusetts Avenue and Mystic Street in Arlington Center. The Arlington Center Safe Travel Project is currently addressing this issue.

There are segments in poor or failing condition; some segments have worn pavement and edge erosion. In addition, the lack of lighting along the bikeway is an impediment to its use at night and in winter months. Crossings of the bikeway at Mill Street and Lake Street create safety concerns and are attributable to traffic congestion on those roads. Further, though near or directly in business districts, there is a lack of physical and cultural connections between the bikeway and commercial establishments, posing a lost economic development opportunity.

Intersection Enhancements for Bicycles. There are several intersections in Arlington which are difficult to cross on a bicycle. One key issue is that traffic actuated signals are not actuated by bicycles, especially on side streets. Some major intersections are in particular not bicycle friendly, including: Massachusetts Avenue/Broadway; Massachusetts Avenue/Route 16; Broadway/Route 16; and Foster Street/Linwood/Massachusetts Avenue.

Corridor Enhancements for Bicycles. Arlington is a key link in the Minuteman Bikeway. Many residents of Arlington use the path, as well as major roadways, to bicycle to and from work. Bike connectivity from the Bikeway and arterials such as Massachusetts Avenue to residential neighborhoods is a high priority. Some roadways connecting these bicycle routes residential neighborhoods, such as Lake Street and Pleasant Street, are narrow and difficult for bicyclists to maneuver.

Bicycle lanes will not be provided between Pond Lane and Swan Place after the Massachusetts Avenue rebuild project and the Arlington Safe Travel Project are completed, creating a disconnect between East Arlington and Arlington Center.

Bus Transit Facilities and Access

Several issues and opportunities for bus transit improvement have been identified.:First, MBTA bus service does not serve some neighborhoods.. In addition, some bus routes run limited service during off peak times. There is also a lack of direct bus service to Belmont, and Medford Center. Second, MBTA buses stack together during peak periods due to congestion and heavy boarding/alighting activity. Routes #77 and #87 are both affected by congestion along the bus routes.

Parking Issues

East Arlington. East Arlington does not have a large public lot for customers or employees, who must rely on street parking on Massachusetts Avenue and residential side streets. The Capitol Theatre and East Arlington restaurants create parking demand in evening hours.

Arlington Heights. This area has not been the subject of a parking study, but, according to Town officials, parking issues persist in the area. A parking study may provide a fresh look at existing parking conditions, identification of areas where parking is needed

and where parking is abundant, and recommendations for future parking management in Arlington Heights.

Arlington Center. The Town is currently undertaking a study of parking in Arlington Center to look at ways to manage the existing parking supply better, including optimal separation of long and short term parking for customers, employees, and students.

GENERAL PARKING CONSIDERATIONS

There is a general lack of wayfinding signage for public parking in the commercial districts. This is a potential safety issue with motorist confusion, causing motorists to circle for on-street parking because they are unaware of the location of off-street lots, in turn creating unnecessary pollution.

Town officials note that pedestrian access between parking areas and nearby businesses is often inade-quate, indirect, or not ADA-compliant. They also note that motorists park on residential streets near Alewife Station before walking to the station to access the MBTA. This can make it difficult for residents to find a parking space on their own street. Some residents have also expressed the desire to be able to park on the street overnight, which is currently prohibited.

Recommendations

- Develop a Complete Streets Policy governing design and implementation of street construction. Complete Streets are designed and operated to provide safety and access for all users of the roadways, including pedestrians, bicyclists, transit riders, motorists, commercial vehicles, and community safety vehicles, and for people of all ages and abilities.
- 2. Create safer pedestrian conditions to increase walking in Arlington, as a means to reduce traffic congestion and improve public health. The Town has already begun an inventory of the condition of its sidewalks and curbs. The next step is to prioritize areas for new sidewalks and improvements to existing sidewalks, to encourage more walking, and allocate resources for implementation. Other improvements to the pedestrian environment, such as lighting and crosswalks, should also be considered. Sidewalk planning should coordinate with the Safe Routes to School (SRTS) program and with a plan designating criteria for pavement types (concrete, asphalt, or brick).

- 3. Improve Minuteman Bikeway. Improve conditions, access, and safety for bicyclists, on the Minuteman Bikeway and on local streets. Strengthen connections between the Minuteman Bikeway and commercial districts to increase customers without increasing need for on street parking.
- 4. Improve Public Transportation Service. Work with the MBTA to improve service and connections, to increase transit ridership.
 - Reduce bus bunching, and improve the efficiency of bus service, including the provision of queue jump lanes, bus-only lanes, bus signal prioritization, and real time bus schedule information.
 - Continue to advocate for extending the Green Line to Mystic Valley Parkway.
- 5. Manage Parking in Commercial Areas. Improve parking availability, especially in the commercial centers through better parking management. Update parking study for East Arlington business district originally conducted as part of Koff Commercial Revitalization Study to develop strategies to improve parking management in the area. A similar study for Arlington Heights parking management might also be considered. Develop parking requirements in zoning regulations that reflect the actual need for parking.
- Reconsider Residential Parking Policies. Review existing residential parking policies regarding overnight residential street regulations and unregulated daytime residential street parking.
 - Unregulated all day parking in residential areas may encourage commuters to park on residential roadways near transit. Consider policies to reduce all day commuter parking in residential neighborhoods, such as using residential parking permits.
 - Overnight residential street parking ban may encourage excessive paving of residential lots. Conversely, the overnight parking ban could be holding down the total number of cars parked in Arlington. Either way, this policy should be looked at in a comprehensive way. Consider fee-based resident overnight parking for residents, or other solutions.

- 7. Address Priivate Ways. Develop a program to improve the condition of private ways. (see Public Facilities recommendation)
- 8. Reduce Congestion. Improve mobility and reduce congestion where possible by harnessing new technology and business models. Coordinate Town and State agencies' efforts to reduce traffic congestion, particularly on north/south corridors connecting to Route 2, such as Pleasant Street and Lake Street







